Field Observations: Progress and Leveraging Results (Part I)

Anna Wilson

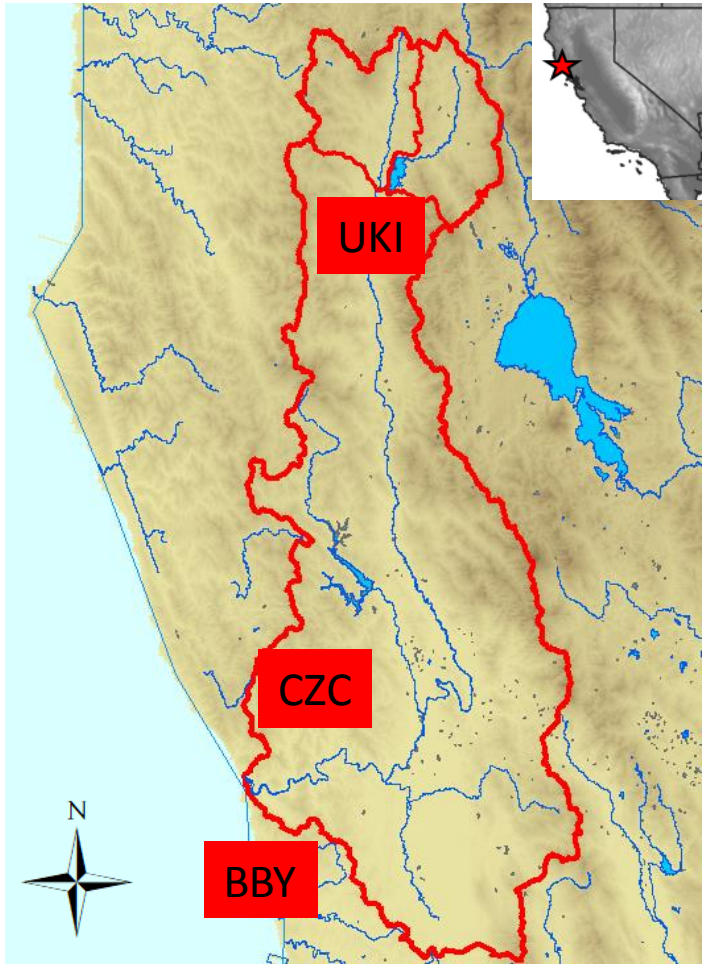
F. Martin Ralph, Brian Henn, Douglas Alden, Steve Turnbull (ERDC), Carly Ellis, Chad Hecht, Will Chapman, Mike Sierks, Meredith Fish, Kara Voss, Lindsey Jasperse, and many others

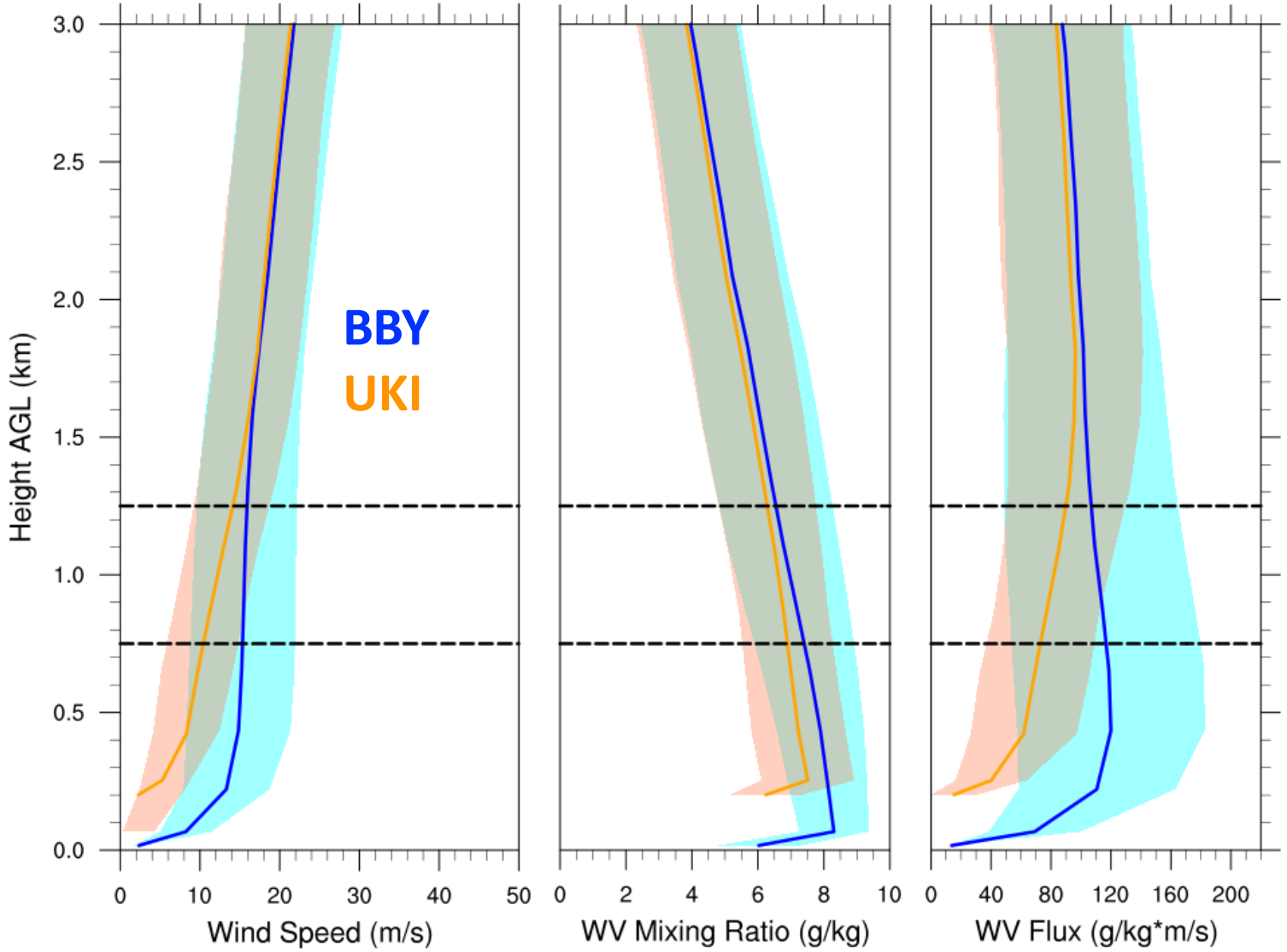
Primary sponsors: US Army Corps of Engineers, California Dept. of Water Resources, Sonoma County Water Agency

Fieldwork Objectives

- What happens when the AR passes over the coastal ranges and/or is channeled by local valleys?
- How do vertical variations in WV modulate AR transport?
- Support assessment of variance in the bulk upslope flux and precipitation relationship
- Support West-WRF modeling
- Improve understanding of the spatial variability of precipitation, soil moisture, and streamflow to inform hydrological modeling forecasts (e.g. GSSHA)
- Quantify runoff volumes and sources of runoff (e.g. surface vs. groundwater) to aid in understanding hydrologic response to ARs
- Observe the hydrometeorology of the watershed during events that provide inflows to Lake Mendocino; diurnal, seasonal, interannual watershed cycles

2017 – 2018 Radiosonde Observations





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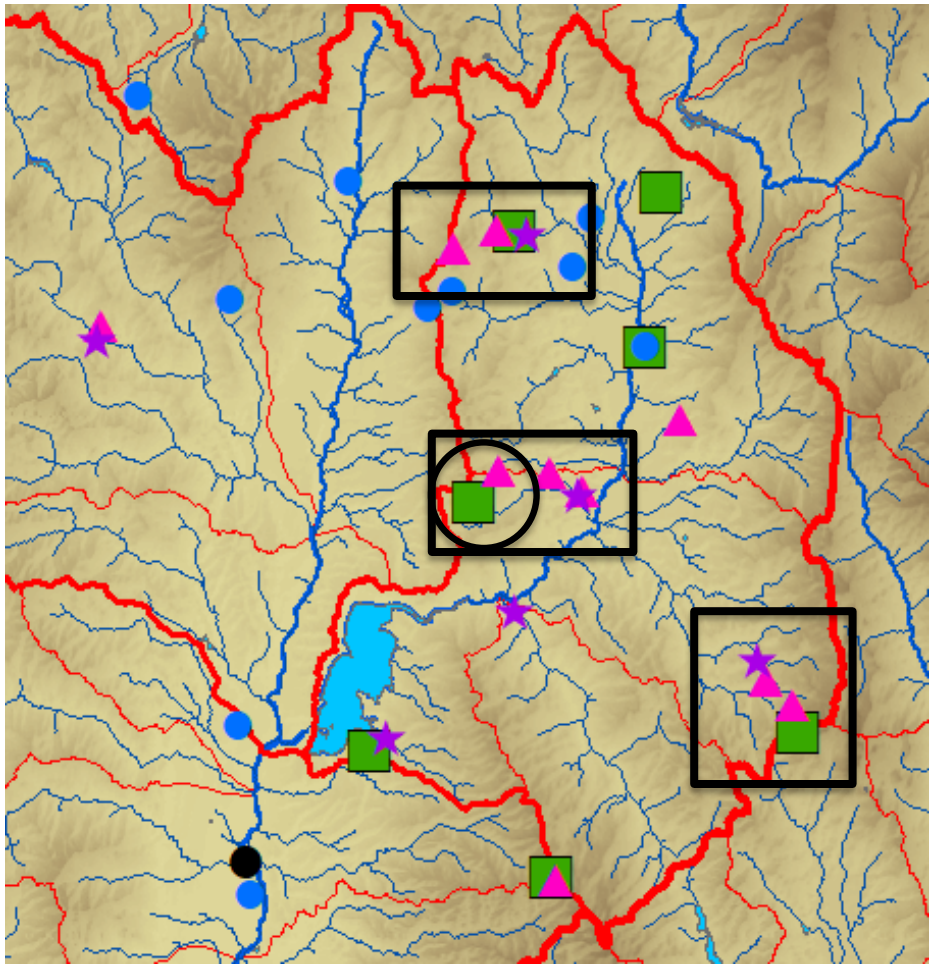
Summer/Fall 2018 – Additional Potter Valley Instrumentation



CW3E Stream Discharge and Isotope Measurements

- Installed 6 level loggers, staff plates, time-lapse cameras in summer/fall 2017 (5 in Potter Valley, 1 in Redwood Valley), conducted stream surveys
- Teams took manual streamflow measurements (partners: SCWA, USGS) – along with the stream level, these measurements allow us to create a rating curve for continuous discharge data at each site
- 5 ISCOs, 4(1) for stream (precip) sampling, groundwater samples (springs) allow analysis of isotopes

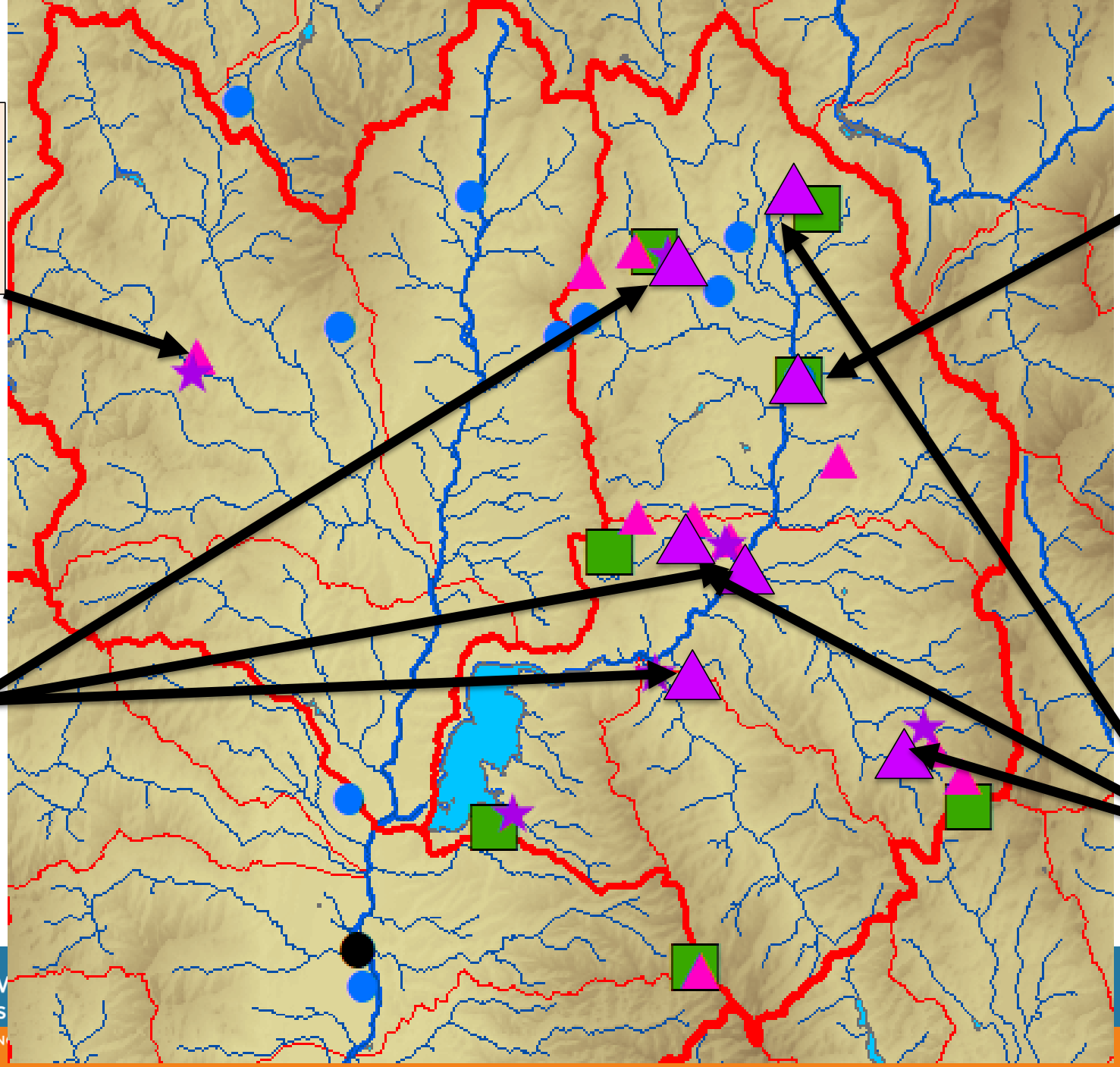
Postdoc Brian Henn, Boyes Creek

Postdoc Forest Cannon

Lab Assistant Lindsey Jasperse

Streamflow measurements on 6 tributaries

Stream isotope sampling on two tributaries and EF Russian River



Precipitation isotope sampling at Potter Valley Fire Department

Groundwater (spring) isotope sampling at three sites

Summary

- Major collaborative efforts underway that integrate data collection, analysis, and modeling to achieve the overarching goal: **Improve forecasts of ARs for the west.** ***This objective is key for water supply resiliency, flood risk mitigation, ecosystem health, and emergency preparedness.***
- Initial results help us to target future efforts – e.g. new field sites in locations where observations will allow us to better understand physical processes and represent them in models
- Next up – soil moisture sites: what are we learning so far?